

Energy Independence and Its Enemies: the bounty of shale oil--and the environmentalist forces that want to keep it buried

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"In my 50 years of following the energy business, this is by far the biggest event I've seen." So says John Deutch, the chemist who ran the CIA under Bill Clinton and is now a professor at MIT. The "event" to which Deutch refers is the development of the technological process known as fracking, which is the shorthand term for hydraulic fracturing. Fracking makes possible the extraction of oil--natural gas in particular--from shale rock formations thousands of feet underground. A mixture of water, sand, and chemicals is pumped downward and sideways at high velocity. It fractures the rock and releases gas upwards to the surface.

The normally dry experts from Citi wrote breathlessly in a recent study called "Energy 2020" that fracking portends nothing less than the "potential reindustrialization of the U.S. economy." They concluded:

"The cumulative impact of new production ... and associated activity may increase real GDP by 2.0 to 3.3 percent." A significant portion of the growth will come, they claimed, "directly from the output of new hydrocarbon production alone, while the rest is generated by multiplier effects as the surge in economic activity drives higher wealth, spending, consumption, and investment effects that ripple through the economy."

Polls show that when presented with these facts, most Americans support the development of natural gas. At the same time, however, there is strong opposition to this energy opportunity coming from those for whom man-made climate change is of paramount concern. Among this group, extracting and consuming more fossil fuels, even relatively cleaner natural gas, will cause too much harm to the planet to be worth the economic benefit. The question facing policymakers today is which side of this argument will win the day: those who want to use the earth's resources to achieve greater human progress or those who want to protect the earth from that progress.

GEOLOGISTS had known for years that there was gas trapped underground, but they did not know how to get it out. Enter George P. Mitchell, a Texas wildcatter who was determined to get it to the surface. Mitchell and his team discovered that by combining a traditional vertical well with horizontal fracturing of the rock, engineers could extract gas that had been trapped in the Barnett Shale in North Texas. After 10 years of trial and error, Mitchell sold his Barnett "play" for \$3.5 billion in 2002, by which time his gas field had become one of the most productive in the country. The fracking revolution had begun.

According to government experts, the United States possesses more than 2,500 trillion cubic feet of technically recoverable natural gas. That is the equivalent of 412.5 billion barrels of oil, and it means that America fight now produces more natural gas per day than Saudi Arabia produces oil. One-third of it is trapped inside shale rock. In 2001, shale gas provided less than 2 percent of the total U.S. natural gas production; now the figure is approaching 30 percent. The U.S. government estimates that based on current consumption rates here at home, these deposits are so rich they could last for 95 years before they are exhausted. Nongovernmental sources say the estimates are far too low and that there may be enough natural gas to last three times longer.

Why is all this natural gas from shale important to the economy? The most immediate result is that it lowers the cost of heating homes. Natural gas used to cost \$15 per thousand cubic feet. Today, the cost is \$2. "The natural

gas glut has pushed down heating bills for millions," according to Bernard L. Weinstein, the associate director of the Maguire Energy Institute. The federal government estimates that home-heating bills in 2012 will be 25 percent lower than they were in 2008.

The abundance of natural gas has also had a huge impact on the cost of electricity. Weinstein says the average electric bill is "half what it was a few years ago." According to a recent analysis by Exxon, "an increasing amount of ... electricity will be generated by natural gas, which will pass coal as the world's second-largest fuel source, behind crude oil, by 2025." An MIT study says the "electricity sector is the principal growth area for natural gas."

In the past five years, exports of natural gas have risen and imports have fallen, thereby reversing the trendline of the previous quarter century and opening the almost unbelievable prospect of the United States becoming a net exporter of gas. There is already high demand for natural gas from Japan (where natural gas sells for \$12), China, and countries throughout Europe, and they are already equipped to accept imported natural gas through receiving terminals. In Louisiana, two operators of terminals designed for the acceptance of imported natural gas are being fitted for export instead. The cost of redesigning them is around \$6 billion each, which gives one a sense of just how confident the operators are about the exporting future.

Perhaps most striking is the way the fracking revolution offers hope for employment in areas of the country that had seemed like terminal cases in the era of globalization and the post-industrial economy. Fracking is now being done in shale fields in North Dakota, Pennsylvania, Ohio, Louisiana, and West Virginia. In North Dakota, the unemployment rate has fallen to 3 percent, due almost entirely to fracking. There has even been job growth in West Virginia. A company called Dominion is now employing 1,300 workers in the state, with an annual payroll of more than \$142 million, and the development of new facilities to help process the shale gas unearthed in Pennsylvania and Ohio suggest there will be a great deal more where that came from.

The most dramatic economic turnaround has been in Pennsylvania, which sits atop the Marcellus Shale, the largest repository of gas in closest proximity to the high-demand northeast. The state estimates that drillers have contributed \$1.3 billion since 2006 in state and local taxes. Tens of thousands of jobs have been created over the past three years both in the industry and among ancillary businesses such as hospitality and construction and financial services.

The impact of abundant natural gas goes beyond the fuel business, home heating, and electricity. Other fields are gaining as well, such as the petrochemical industry. According to the *Wall Street Journal*, cheap gas is "breathing new life into energy intensive industries such as steel and plastics." Local businesses in Charleston, South Carolina, lobbied hard for a huge new chemical plant called an ethane catalytic cracker. A cracker is a petrochemical facility that converts ethane (in this case from the Marcellus Shale) into ethylene, which is used to make plastics. "It will take approximately 2,000 construction workers two years just to build the facility," says Matthew Ballard, president and chief executive officer of the Charleston Area Alliance. There will be several hundred new jobs there once it is up and running.

A cracker plant soon to get under way in the Pittsburgh suburbs is, according to Pennsylvania governor Tom Corbett, "the single largest industrial development in the state's southwest in more than a generation." Constructing the new facility is expected to create up to 10,000 jobs, and, as in Charleston, hundreds more will work there when it is completed.

Thus, cheap natural gas is bringing back "the basic kind of jobs we've been hemorrhaging for decades," says Dan Kish, senior vice president for policy at the Institute for Energy Research. "People who work with their hands and make stuff and fix things, those jobs have been going down the tubes [for decades] and everyone has been

crying for more manufacturing jobs and this is it."

A PricewaterhouseCoopers study published last December estimates that the availability and abundance of shale gas could result in a million new manufacturing jobs by 2025. The revived natural gas industry "has the potential to spark a manufacturing renaissance in the U.S., including billions in cost savings, a significant number of new jobs and a greater investment in U.S. plants," in the words of Robert McCutcheon, the United States industrial products and metals leader at PricewaterhouseCoopers.

All of this pales, in some sense, beside the benefits to the national interests of the United States. In 2010 we imported 9.4 million barrels of oil a day. And as Sen. Richard Lugar said in 2006, the problem is that "most of the world's oil is concentrated in places that are either hostile to American interests or vulnerable to political upheaval and terrorism." With the availability of oil and natural gas in the U.S. as well as from our ally Canada, the future energy-security picture looks much different. The phrase "energy independence," which has been thrown around by both parties as a meaningless sound bite over the past decade, is no longer a species of fantasy. The notion that the United States will no longer need to calibrate its foreign policy around the elusive stability of the Middle East's oil-rich regimes might just become a reality. How much different would our foreign policy look if we didn't have to rely on Iran to keep our oil imports traveling through the Strait of Hormuz? And how much stronger a position would we be in vis-à-vis the Chinese if we were exporting energy rather than begging to import it?

So why aren't both parties in the United States celebrating this bounty beneath? Why hasn't fracking become the dominant good-news economic story of our time? And why hasn't President Obama, who needs to find something besides government spending to revitalize the U.S. economy, clasped fracking to his bosom and promoted its development as this century's energy solution?

The answer was recently made clear by Secretary of State Hillary Clinton when she said the world is suffering from a "climate crisis." For those, like Clinton, who believe the most pressing issue facing our society is climate change, and that humans are the ones causing the problem, any effort that results in increased consumption of fossil fuels such as natural gas is anathema. Proponents of this view have been working tirelessly to move the United States toward what they call a cleaner energy future by reducing our consumption of and reliance on energies that are harmful to the environment, namely, "dirty" carbon-producing coal and oil.

The opposition to fracking stems from the belief that the method of extracting natural gas from shale formations pollutes the environment and that burning natural gas for energy isn't as "clean" as using solar or wind power. Clean-energy proponents argue that we should be moving as fast as possible to using nonpolluting, non-carbon-producing energy sources rather than transitioning to a less-dirty alternative to coal and oil.

For some, opposing fracking is about quality of life. "Economically, I would say, there's no question that it would be good, if you are willing to write off the lifestyle, the peace and quiet, the surface-value rights, all that sort of stuff," argues James Northrup, a former oil and gas investor turned anti-fracking activist in Cooperstown, N.Y., 75 miles west of Albany.

Other fracking critics say that some of the gases come up from the well during the drilling process and thereby pollute groundwater. In Josh Fox's Oscar-nominated documentary *Gasland*, for example, one Colorado man living near a drilling site is able to ignite his kitchen tap water because of all the methane mixed up with his well water. Methane is indeed one of the gases released from shale drilling. There have been successful lawsuits filed against drillers operating in northeastern Pennsylvania for polluting water sources, and some communities have been torn apart by fights between those who have leased their land to drillers and neighbors who sued the

operator for allegedly polluting their water.

The *New York Times* upped the ante in the fracking-causes-pollution meme with a series of explosive news reports early last year on allegedly radioactive fracking wastewater polluting Pennsylvania's rivers and streams.

The most recent and controversial claim against natural gas development comes from the Cornell environmental biologist Robert Howarth. Last year he published the study "Methane and the greenhouse-gas footprint of natural gas from shale formations." It purports to prove that "compared [with] coal, the [climate] footprint of shale gas is at least 20 percent greater and perhaps more than twice as great on the 20-year horizon and is comparable when compared over 100 years."

Howarth's claim that fracking causes global warming electrified environmentalists. Many began arguing that previous discussions of the economic possibilities of natural gas development couldn't justify endangering the planet. And whereas previous debate over natural gas development might have been a question of scope--how many wells, how much fracking--the conversation turned to blanket opposition to any fracking whatsoever, and various towns and cities passed ordinances banning drilling within their confines. Landowners in some of these communities have opposed the bans, demanding that their property rights (to choose to lease acreage to drillers) be respected. But in many cases, the property owners are outnumbered and the environmentalists are louder.

But in fact, the fracking-poisons-groundwater complaint has largely proven to be overblown. The reality is that many places around the U.S. have naturally occurring methane, and if water wells aren't properly constructed and sealed, or have aged and become damaged, gas can seep into groundwater. But there is no evidence of a direct link between shale gas drilling and groundwater contamination. Indeed, the Environmental Protection Agency has lately had to retreat from several investigations against energy companies operating in Pennsylvania and Texas, where the agency had alleged that drilling caused groundwater contamination. And EPA administrator Lisa Jackson has recently admitted that there is no evidence that fracking has *ever* directly polluted groundwater. States such as Pennsylvania, meanwhile, have worked hard in developing regulations to prevent any future contamination by mandating properly sealed drilling wells and proper cement-casing standards for those wells. The *Times* reports about "radioactive" fracking wastewater were studied by state regulators and other experts, who concluded that the trace amounts of radioactive particles were so small as to be insignificant.

As for Howarth's research on fracking's carbon footprint, his conclusions were quickly debunked by fellow researchers at Cornell as well as by other scientists. As Lawrence M. Cathles of Cornell's Department of Earth and Atmospheric Sciences concluded in his rebuttal, "The data clearly shows that substituting natural gas for coal will have a substantial greenhouse benefit under almost any set of reasonable assumptions. Methane emissions must be five times larger than they currently appear to be before gas substitution for coal becomes detrimental from a global warming perspective on any time scale."

The debate over fracking has gotten so extreme, in fact, that reasonable environmentalists are beginning to complain. As Andrew Revkin, one of the deans of environmental reporting in the United States, recently noted, fracking opponents sound so intransigent that he questions whether there is any resource to which the anti-gas advocates would say yes.

The great irony is that only a few short years ago, many environmentalists were promoting natural gas as the cleaner alternative to oil and coal. The theory was that natural gas would provide a temporary bridge from pollutants such as oil and coal to so-called clean tech (wind and solar electricity generation, some nuclear power, and electric cars). Now that natural gas is cheap and plentiful, however, many openly worry that there may never be a full-scale transition to wind and solar because there won't be a need. Gas is cleaner than coal and oil, it is

equally or more efficient, it has the same applications as coal and oil, and it can be exported. Wind and solar haven't proven to be cost-effective, nor are they easy to transport or possible to export. This realization has led to near hysterical opposition to fracking. As Howarth himself argued recently, "It is pure folly to view shale gas [as] a bridge fuel to a green future."

These are the arguments, moreover, that help explain the otherwise inexplicable rejection of natural gas extraction in New York, a state that could desperately use new industry and new revenues. There is gas from the Marcellus Shale under the state's southern tier, and there are gas companies that came into the state nearly five years ago to lease land for potential drilling. But in 2007, the state decided that, absent new regulations for hydraulic fracturing, no new permits for natural gas wells would be issued. The moratorium continues to this day, even as Andrew Cuomo, the state's governor, keeps promising that his Department of Environmental Conservation will produce new drilling rules--once its experts have had sufficient time to study the issue.

New York's drilling ban is even odder when you consider that next door in Pennsylvania, not only is gas drilling ongoing and successful, but there is an established record of successful regulation. As the state's former Democratic governor, Ed Rendell, and the former head of its Department of Environmental Protection (DEP), John Hanger, wrote to the *New York Times* earlier this year: "Pennsylvania has the strongest enforcement program of any state with gas drilling. Period. From January 1, 2008, to June 30, 2010, the DEP issued 1,400 violations to drilling companies."

On the basis of Pennsylvania's experience, Rendell told a New York audience in June 2011, "If Gov. Cuomo asked me my advice about lifting the moratorium, I would tell him the moratorium should be lifted." In his state, the "unemployment rate was 7.5 percent at a time when [the] national rate [was] 9.0 percent and most industrial states are higher than the national average," he said. "Pennsylvania is the third-highest creator in jobs behind Texas and California. These numbers are in part because of shale drilling."

Given the economic potential of natural gas development and that the fears of its environmental effect are largely without foundation, why is there any debate at all about the efficacy and desirability of natural gas? The answer is that there is something anathematic to the environmentalist movement and its supporters in the Democratic Party about economic growth and employment that might arise from the harvesting of shale.

President Obama himself is a perfect illustration of how much the so-called clean, anti-growth, antidevelopment dogma holds sway over his party. By the time Obama took over the White House in 2009, the "shale gale" was still in its early stages, but its potential was already evident. And yet when the president designed his stimulus package to save the U.S. economy, there was almost nothing in it relating to fracking--even though it is a textbook example of a shovel-ready technological product. Instead, obsessed with so-called clean tech, Obama and his Energy Department targeted solar and wind companies for subsidies and loans, with predictably negligible results. Obama forced the newly bailed-out automakers to develop clean, electric cars such as the Chevy Volt. The administration even promoted \$7,500 rebates for those who purchased the more than \$40,000 car of the future.

Alas, the newly elected president had been utterly certain clean tech would produce the economic windfall its advocates had told him it would. In his book, *The Escape Artists*, Noam Scheiber writes of the two months before Obama's inauguration:

Energy was a particular obsession of the

president-elect's, and therefore a particular source of frustration. Week after week, [economic adviser Christina] Romer would march in with an estimate of the jobs all the investments in clean energy would produce; week after week, Obama would send her back to check the numbers. "I don't get it," he'd say. "We make these large-scale investments in infrastructure. What do you mean, there are no jobs?" But the numbers rarely budged.

The relatively untutored president, who had had only two years in a statewide office before he ran for president, may never have had even so much as a conversation on energy matters with anyone in public life who was not a member of the environmentalist camp. But by early 2012, Obama had certainly been on the job long enough to assimilate new information regarding the potential of natural gas, when he was forced into a decision over granting valuable right of way in the United States for the Keystone XL pipeline from Canada. He stuck to his old script and had the State Department deny the pipeline permit. Facing a tough economy and a tough reelection campaign, Obama has been presented a political gift in the form of shale gas--and he has rejected it.

He still has time to reverse himself. In March, polls showed that a strong majority of Americans want the pipeline approved. Obama quickly made a special stop in Oklahoma to take credit for approving one small section of it (to fix a supply-chain glut). When a proposed new route for the pipeline was announced in April, a route that reflected some environmental concerns about potential hazards to wetlands, the president had a perfect opportunity to save face, present himself as the defender of the environment and as an energy realist at the same time, and approve it. He did not. As of this writing, no decision has been made and it is likely no decision will be--although it would mark a dramatic sign of the urgency of Obama's desire to win reelection if he reversed himself. Can one imagine Bill Clinton, the last successful national Democratic politician, rejecting such a bounty solely due to pressure from the ideological left?

The question goes beyond the merely partisan. The real issue, going forward, is whether the American people will permit the environmental movement to deny the United States its surprising and providential chance for true energy independence.

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